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FEDERAL - STATE - PRIVATE
COOPERATIVE SNOW SURVEYS

U. S. DEPT. OF AGRICULTURE
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CURRENT SERIAL RECORDS

WATER SUPPLY OUTLOOK and **FEDERAL - STATE - PRIVATE COOPERATIVE SNOW SURVEYS** for **WASHINGTON**

UNITED STATES DEPARTMENT of AGRICULTURE...SOIL CONSERVATION SERVICE,
and
DEPARTMENT of CONSERVATION STATE of WASHINGTON

Data included in this report were obtained by the agencies named above in cooperation with the U.S. Forest Service, U.S. Geological Survey, National Park Service, and other Federal, State and private organizations.

||||||| AS OF |||||
JUNE 1, 1966

UNITED STATES DEPARTMENT OF AGRICULTURE - SOIL CONSERVATION SERVICE

To Recipients of Water Supply Outlook Reports:

Most of the usable water in western states originates as mountain snowfall. This snowfall accumulates during the winter and spring, several months before the snow melts and appears as streamflow. Since the runoff from precipitation as snow is delayed, estimates of snowmelt runoff can be made well in advance of its occurrence. Streamflow forecasts published in this report are based principally on measurement of the water equivalent of the mountain snowpack.

Forecasts become more accurate as more of the data affecting runoff are measured. All forecasts assume that climatic factors during the remainder of the snow accumulation and melt season as they affect runoff will add to be an effective average. Early season forecasts are therefore subject to a greater change than those made on later dates.

The snow course measurement is obtained by sampling snow depth and water equivalent at surveyed and marked locations in mountain areas. A total of about ten samples are taken at each location. The average of these are reported as snow depth and water equivalent. These measurements are repeated in the same location near the same dates each year.

Snow surveys are made monthly or semi-monthly from January 1 through June 1 in most states. There are about 1400 snow courses in Western United States and in the Columbia Basin in British Columbia. In the near future, it is anticipated that automatic snow water equivalent sensing devices along with radio telemetry will provide a continuous record of snow water equivalent at key locations.

Detailed data on snow course and soil moisture measurements are presented in state and local reports. Other data on reservoir storage, summaries of precipitation, current streamflow, and soil moisture conditions at valley elevations are also included. The report for Western United States presents a broad picture of water supply outlook conditions, including selected streamflow forecasts, summary of snow accumulation to date, and storage in larger reservoirs.

Snow survey and soil moisture data for the period of record are published by the Soil Conservation Service by states about every five years. Data for the current year is summarized in a West-wide basic data summary and published about October 1 of each year.

Listed below are water supply outlook reports based on Federal-State-Private Cooperative snow surveys. Those published by the Soil Conservation Service may be obtained from Soil Conservation Service, Room 507, Federal Building, 701 N. W. Glisan, Portland, Oregon 97209.

PUBLISHED BY SOIL CONSERVATION SERVICE

| <u>REPORTS</u> | <u>ISSUED</u> | <u>LOCATION</u> | <u>COOPERATING WITH</u> |
|-------------------------|----------------------------------|------------------------|----------------------------------------------------------------------------------------|
| RIVER BASINS | | | |
| WESTERN UNITED STATES | MONTHLY (FEB.-MAY) | PORTLAND, OREGON | ALL COOPERATORS |
| BASIC DATA SUMMARY | OCTOBER 1 | PORTLAND, OREGON | ALL COOPERATORS |
| STATES | | | |
| ALASKA | MONTHLY (MAR.-MAY) | PALMER, ALASKA | ALASKA S.C.D. |
| ARIZONA | SEMI-MONTHLY (JAN.15 - APR.1) | PHOENIX, ARIZONA | SALT R. VALLEY WATER USERS ASSOC. ARIZ. AGR. EXP. STATION |
| COLORADO AND NEW MEXICO | MONTHLY (FEB.-MAY) | FORT COLLINS, COLORADO | COLO. STATE UNIVERSITY COLO. STATE ENGINEER N. MEX. STATE ENGINEER |
| IDAHO | MONTHLY (JAN.-JUNE) | BOISE, IDAHO | IDAHO STATE RECLAMATION ENGINEER |
| MONTANA | MONTHLY (JAN.-JUNE) | BOZEMAN, MONTANA | MONT. AGR. EXP. STATION |
| NEVADA | MONTHLY (JAN.-MAY) | RENO, NEVADA | NEVADA DEPT. OF CONSERVATION AND NATURAL RESOURCES - DIVISION OF WATER RESOURCES |
| OREGON | MONTHLY (JAN.-JUNE) | PORTLAND, OREGON | OREG. STATE UNIVERSITY OREGON STATE ENGINEER |
| UTAH | MONTHLY (JAN.-JUNE) | SALT LAKE CITY, UTAH | UTAH STATE ENGINEER |
| WASHINGTON | MONTHLY (FEB.-JUNE) | SPOKANE, WASHINGTON | WN. STATE DEPT. OF CONSERVATION |
| WYOMING | MONTHLY (FEB.-JUNE) | CASPER, WYOMING | WYOMING STATE ENGINEER |

PUBLISHED BY OTHER AGENCIES

| <u>REPORTS</u> | <u>ISSUED</u> | <u>AGENCY</u> |
|------------------|---------------------|---------------------------------------------------------------------------------------------------------------------|
| BRITISH COLUMBIA | MONTHLY (FEB.-JUNE) | WATER RESOURCES SERVICE, DEPT. OF LANDS, FOREST AND WATER RESOURCES, PARLIAMENT BLDG., VICTORIA, B.C., CANADA |
| CALIFORNIA | MONTHLY (FEB.-MAY) | CALIF. DEPT. OF WATER RESOURCES, P.O. BOX 388, SACRAMENTO, CALIF. |

FEDERAL-STATE-COOPERATIVE
SNOW SURVEY AND WATER SUPPLY FORECASTS

For

WASHINGTON

Report Prepared
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Department of Conservation
State of Washington

WATER SUPPLY OUTLOOK

State of Washington

June 1, 1966

* * * * *
* The water supply outlook for irrigation and power in the State of *
* Washington has deteriorated even further than was reported last *
* month. The extremely dry weather that has persisted for the last *
* two months has slowed runoff to only a fraction of its normal flow *
* on most tributary streams and the snowpack is fast depleting. Ex- *
* cept for the mainstem of the Columbia down to the mouth of the *
* Snake, water conditions are now considered poor over most of the *
* State of Washington with the possibility of critically low flows in *
* certain areas. Subsequent precipitation or the lack of it will be *
* the deciding factor. *
* * * * *

SNOW COVER

Wherever there are past records to be used for comparison purposes, the depletion of the snowpack greatly exceeded the normal rate for the month. Some courses went from a May 1 reading of 160% of normal to a May 15 reading of only 50% or a decrease of 110%. Not all of the decreases were so dramatic but this gives some indication of the lack of water in the upper watersheds.

Very few of the snow courses in Washington are scheduled to be read on either May 15 or June 1. Only those key courses at higher elevations are measured or even have snow.

Much of the data reported in the appendix is for measurements made at non-regular times; e.g., April 10, April 20 and May 10. These measurements were made at the request of the Bureau of Reclamation for their "Cascade Atmospheric Water Resources Program" as were the establishment of the new snow courses in the headwaters of the Yakima River. This coming year these courses will be reported monthly.

SOIL MOISTURE

All of the soil moisture stations read on the first of June were reported to have soil mantles that are drying out. The top layers of the soil profile are quite dry with the middle layers drying and the lower holding about the same as last month. Again it is the lack of precipitation during the past two months which is responsible although the cool weather has slowed down both the surface evaporation and the evapotranspiration rate.

RESERVOIR STORAGE - 1000 Acre Feet - June

| BASIN or STREAM | RESERVOIR | USABLE ^{1/} CAPACITY | Measured (June 1) | | | Normal* |
|--------------------|------------------------------|----------------------------------|-------------------|--------|--------|---------|
| | | | 1966 | 1965 | 1965 | |
| <u>COLUMBIA</u> | | | | | | |
| Spokane | Coeur d'Alene Lake | 225.1 | 172.2 | 272.4 | 425.5 | 357.9 |
| Columbia | Franklin D. Roosevelt Lake | 5232.0 | 3843.2 | 3505.0 | 3370.0 | 4381.2 |
| Columbia | Banks Lake ^{2/} | 761.8 | 551.9 | 363.6 | 320.0 | 463.3 |
| Okanogan | Conconully Reservoir | 13.0 | 1.5 | 5.3 | 5.1 | 11.8 |
| Okanogan | Salmon Lake | 10.5 | 8.2 | 9.2 | 9.5 | 9.9 |
| Chelan | Lake Chelan | 676.1 | 394.2 | 582.0 | 330.2 | 490.2 |
| <u>YAKIMA</u> | | | | | | |
| Yakima | Keechelus Lake | 157.8 | 144.3 | 153.2 | 107.6 | 140.5 |
| Kachess | Kachess Lake | 239.0 | 230.7 | 232.6 | 209.8 | 229.4 |
| Cle Elum | Lake Cle Elum | 436.9 | 399.8 | 411.8 | 242.8 | 410.3 |
| Bumping | Bumping Lake | 33.7 | 19.9 | 24.8 | 19.9 | 33.1 |
| Tieton | Rimrock Lake | 198.0 | 164.1 | 194.1 | 94.9 | 184.3 |
| <u>PUGET SOUND</u> | | | | | | |
| Skagit | Ross Reservoir ^{2/} | 1202.9 | 927.6 | 1126.7 | 827.6 | 854.3 |
| Skagit | Diablo Reservoir | 90.6 | 84.0 | 82.6 | 84.1 | 84.2 |
| Skagit | Gorge Reservoir | 9.8 | 8.1 | 8.0 | 8.6 | -- |

^{1/} Based on Active Storage

^{2/} Less than 15-year record in period 1948-62

* 15-year average 1948-62

SOIL MOISTURE - JUNE

| Drainage Basin and Station | Number | Elev. | Profile (Inches) Depth | : Total Capacity | Soil Moisture Content (Inches) as of June 1 | | |
|----------------------------------|--------|-------|---------------------------|------------------------|------------------------------------------------|------|------|
| | | | | | 1966 | 1965 | 1964 |
| <u>CRAB CREEK</u> | | | | | | | |
| Creston-Kunz | 18B1m | 2440 | 48 | 13.6 | 8.5 | 9.0 | 10.5 |
| Jack Woods | 18B3m | 2600 | 48 | 13.6 | 7.7 | 7.8 | 6.7 |
| Krause | 18B4m | 2440 | 48 | 13.6 | 8.6 | 8.2 | 8.4 |
| Sheffels | 18B5m | 2360 | 48 | 13.6 | 6.7 | 8.3 | 4.9 |
| Wheatridge | 18B6m | 2200 | 48 | 13.6 | 6.2 | 6.5 | 6.8 |
| <u>OKANOGAN</u> | | | | | | | |
| Trout Creek | 3-M | 3600 | 48 | 7.3 | 5.6* | -- | 7.1 |
| <u>YAKIMA</u> | | | | | | | |
| Domery Flat | 21B20m | 2200 | 48 | 6.9 | 4.7* | 4.2 | -- |
| Lake Cle Elum | 21B14M | 2200 | 48 | 12.8 | 9.2* | 9.5 | 9.2 |
| <u>WALLA WALLA</u> | | | | | | | |
| Couse | 17C3m | 3650 | 48 | 11.1 | 7.1 | 10.5 | 8.2 |
| Helmerts | 17C2M | 4400 | 48 | 12.0 | 10.2 | 11.9 | 11.2 |
| <u>WENATCHEE</u> | | | | | | | |
| Upper Wheeler | 20B7M | 4400 | 48 | 12.7 | 9.0 | 9.0 | -- |

* May 15th measurement

FALL SOIL MOISTURE

| Drainage Basin and Station | Number | Elev. | Profile (Inches) | | Soil Moisture Content | | |
|----------------------------------|--------|-------|------------------|----------|-----------------------|-----------------------|------|
| | | | Depth | Capacity | Total | (Inches) as of Oct. 1 | |
| | | | | | 1965 | 1964 | 1963 |
| <u>CRAB CREEK</u> | | | | | | | |
| Creston-Kunz | 18B1m | 2440 | 48 | 13.6 | 4.9 | 5.4 | 5.1 |
| Jack Woods | 18B3m | 2600 | 48 | 13.6 | 5.0 | 4.4 | 6.3 |
| Krause | 18B4m | 2440 | 48 | 13.6 | 5.8 | 5.9 | 5.2 |
| Sheffels | 18B5m | 2360 | 48 | 13.6 | 4.0 | 3.7 | 3.7 |
| Wheatridge | 18B6m | 2200 | 48 | 13.6 | 4.2 | 4.1 | 4.5 |
| <u>OKANOGAN</u> | | | | | | | |
| Trout Creek | 3-M | 3600 | 48 | 7.3 | 4.1 | 4.9 | 4.1 |
| <u>YAKIMA</u> | | | | | | | |
| Domery Flat | 21B20m | 2200 | 48 | 6.9 | 1.9 | 4.4 | -- |
| Lake Cle Elum | 21B14M | 2200 | 48 | 12.8 | 6.9 | 8.5 | 6.6 |
| <u>WALLA WALLA</u> | | | | | | | |
| Couse | 17C3m | 3650 | 48 | 11.1 | 6.0 | 5.6 | 5.7 |
| Helmers | 17C2M | 4400 | 48 | 12.0 | 6.2 | 6.0 | 5.8 |
| <u>WENATCHEE</u> | | | | | | | |
| Upper Wheeler | 20B7M | 4400 | 48 | 12.7 | 6.2 | 5.3 | -- |

APPENDIX 1

SNOW DATA - MAY 15 & JUNE 1, 1966
(and Previous Unreported Data)

| DRAINAGE BASIN and SNOW COURSE | | | SNOW COVER MEASUREMENT | | | | | | |
|--------------------------------------------------|--------|------|------------------------|------------------------|------------------------------|--------------------------------|------|--------|--|
| | | | 1966 | | | :P a s t R e c o r d | | | |
| | | | Date of Survey | Snow Depth (In.) | Water : Content: (In.) | Water Content (In.) 1948-62 | | | |
| No. | Elev. | | | | :1965 | 1964 | Avg. | | |
| <u>U P P E R C O L U M B I A D R A I N A G E</u> | | | | | | | | | |
| <u>PEND OREILLE RIVER</u> | | | | | | | | | |
| Nelson | Canada | 3050 | 5/17 | 1 | 0.4 | 1.7 | 4.2 | 0.8** | |
| <u>KETTLE RIVER</u> | | | | | | | | | |
| Big White Mtn. | Canada | 5500 | 4/28 | 40 | 16.0 | New Course | | | |
| | | | 5/15 | 22 | 9.3 | | | | |
| | | | 5/31 | 8 | 3.6 | | | | |
| Lower Trapping Cr. | Canada | 3050 | 4/28 | 0 | 0.0 | New Course | | | |
| Monashee Pass | Canada | 4500 | 5/13 | 15 | 7.3 | 6.9 | 13.9 | 11.6** | |
| | | | 5/31 | 1 | 0.6 | 1.0 | 8.7 | 3.6** | |
| Old Glory Mtn. | Canada | 7000 | 5/16 | 64 | 28.2 | 25.7 | 34.8 | 28.9** | |
| | | | 5/30 | 22 | 11.5 | 16.8 | 24.5 | 17.7** | |
| Upper Trapping Cr. | Canada | 4450 | 4/28 | 7 | 2.7 | New Course | | | |
| | | | 6/1 | 0 | 0.0 | New Course | | | |
| <u>OKANOGAN RIVER</u> | | | | | | | | | |
| Blackwall Mtn. | Canada | 6250 | 5/13 | 51 | 26.6 | 32.3 | 49.2 | 37.5** | |
| | | | 5/31 | 34 | 18.8 | 30.8 | 44.1 | 29.3** | |
| Enderby | Canada | 6250 | 5/13 | 86 | 36.4 | 40.1 | 51.5 | -- | |
| | | | 5/31 | 73 | 38.0 | 39.4 | 48.8 | -- | |
| Hamilton Hill | Canada | 4900 | 5/15 | 0 | 0.0 | 3.3 | 13.4 | -- | |
| | | | 6/1 | 0 | 0.0 | 0.0 | 2.4 | -- | |
| Isontok Lake | Canada | 5510 | 5/14 | 0 | 0.0 | 0.0 | -- | -- | |
| Lost Horse Mtn. | Canada | 6300 | Not Measured | | | 9.4 | 13.9 | 10.2** | |
| | | | 5/30 | 0 | 0.0 | 5.1 | 5.4 | 4.2** | |
| Lower Esperon Cr. | Canada | 4270 | 4/29 | 15 | 6.2 | New Course | | | |
| | | | 5/13 | 1 | 0.4 | | | | |
| | | | 5/27 | 0 | 0.0 | | | | |
| McCulloch | Canada | 4200 | 5/15 | 0 | 0.0 | 0.5 | 1.8 | 0.8** | |
| Middle Esperon Cr. | Canada | 4580 | 4/29 | 15 | 6.8 | New Course | | | |
| | | | 5/13 | 1 | 0.4 | | | | |
| | | | 5/27 | 0 | 0.0 | | | | |

** Average for years of record

APPENDIX 2

| | | | SNOW COVER MEASUREMENT | | | | | |
|-------------------------------|--------|-------|------------------------|-----------------------|----------|---------------------|------|--------|
| | | | 1966 | : P a s t R e c o r d | | | | |
| DRAINAGE BASIN | | | Date | Snow | Water | Water Content (In.) | | |
| and | | | of | Depth | Content: | 1948-62 | | |
| SNOW COURSE | No. | Elev. | Survey | (In.) | (In.) | :1965 | 1964 | Avg. |
| <u>OKANOGAN RIVER (Cont.)</u> | | | | | | | | |
| Missezula Mtn. | Canada | 5100 | Not Measured | | | 0.0 | 6.3 | 2.1** |
| | | | Not Measured | | | 0.0 | 0.0 | -- |
| Mission Creek | Canada | 4500 | 5/14 | 34 | 19.7 | 18.8 | 23.2 | 18.8** |
| | | | 5/29 | 22 | 9.1 | 12.6 | 20.5 | 10.5** |
| Monashee Pass | Canada | 4500 | 5/13 | 15 | 7.3 | 6.9 | 13.9 | 11.6** |
| | | | 5/31 | 1 | 0.6 | 1.0 | 8.7 | 3.6** |
| Mt. Kobau | Canada | 5950 | 5/1 | 23 | 8.5 | New Course | | |
| | | | 5/15 | 9 | 3.5 | | | |
| | | | 5/29 | 0 | 0.0 | | | |
| Silver Star Mtn. | Canada | 6050 | 5/13 | 43 | 20.4 | 19.4 | 33.0 | 24.7** |
| | | | 5/31 | 20 | 10.2 | 11.0 | 25.0 | 14.6** |
| Trout Creek | Canada | 4700 | 5/15 | 0 | 0.0 | 1.1 | 1.9 | 1.2** |
| Upper Esperon Cr. | Canada | 4290 | 4/29 | 34 | 15.6 | New Course | | |
| | | | 5/13 | 14 | 6.4 | | | |
| | | | 5/27 | 1 | 0.4 | | | |
| <u>ENTIAT RIVER</u> | | | | | | | | |
| Pope Ridge | 20B20 | 4300 | 5/11 | 0 | 0.0 | New Course | | |
| Pugh Ridge + | 20A32a | 6400 | 5/13 | 31 | 15.5 | New Aerial Marker | | |
| Snow Brushy + | 20A35a | 3850 | 5/13 | 18 | 9.0 | New Aerial Marker | | |
| Tommy Creek + | 20B21a | 5300 | 5/13 | 0 | 0.0 | New Aerial Marker | | |
| <u>WENATCHEE RIVER</u> | | | | | | | | |
| Lake Wenatchee | 20B5 | 1970 | 4/19 | 7 | 3.0 | -- | -- | -- |
| Blewitt Pass | 20B2 | 4270 | 4/20 | 17 | 8.7 | -- | -- | -- |
| | | | 5/9 | 0 | 0.0 | -- | -- | -- |
| Stevens Pass | 21B1 | 4070 | 5/16 | 66 | 31.7 | 41.2 | 72.7 | 48.7* |
| | | | 6/2 | 32 | 15.7 | 31.9 | 60.3 | 29.5* |
| <u>YAKIMA RIVER</u> | | | | | | | | |
| Big Boulder Creek | 21B9 | 3200 | 4/21 | 16 | 6.1 | -- | -- | -- |
| | | | 5/3 | 0 | 0.0 | -- | -- | -- |
| Bumping Lake | 21C8 | 3450 | 5/14 | 0 | 0.0 | 0.0 | 4.2 | 5.0* |
| Cooper Pass | 21B36 | | 4/20 | 55 | 24.6 | New Course | | |
| | | | 4/29 | 38 | 17.0 | | | |
| | | | 5/10 | 7 | 3.2 | | | |

+ Snow water equivalent estimated from aerial stadia observation

* Adjusted 1948-62 average

** Average for years of record

APPENDIX 3

| | | | SNOW COVER MEASUREMENT | | | | | |
|--------------------------------------|--------|-------|------------------------|------------------------|------------------------------|---------------------|------|-----------------|
| | | | 1966 | : P a s t R e c o r d | | | | |
| DRAINAGE BASIN and SNOW COURSE | No. | Elev. | Date of Survey | Snow Depth (In.) | Water : Content: (In.) | Water Content (In.) | | |
| | | | | | | :1965 | 1964 | 1948-62 Avg. |
| <u>YAKIMA RIVER (Cont.)</u> | | | | | | | | |
| Hyak | 21B34 | | 4/20 | 25 | 10.8 | New Course | | |
| | | | 4/29 | 10 | 4.8 | | | |
| Kachess Dam | 21B38 | | 4/21 | 0 | 0.0 | New Course | | |
| | | | 4/29 | 0 | 0.0 | | | |
| Kachess Peninsula | 21B37 | | 4/20 | 31 | 12.2 | New Course | | |
| | | | 4/29 | 12 | 5.6 | | | |
| Lake Cle Elum | 21B14M | 2200 | 5/9 | 0 | 0.0 | 0 | 0.0 | -- |
| Fish Lake | 21B4 | 3371 | 4/21 | 48 | 22.0 | -- | -- | -- |
| | | | 5/11 | 7 | 4.1 | -- | -- | -- |
| Morgan Creek | 21B40 | | 4/20 | 0 | 0.0 | New Course | | |
| | | | 4/29 | 0 | 0.0 | | | |
| Noble Creek | 21B35 | | 4/20 | 29 | 11.4 | New Course | | |
| | | | 4/29 | 14 | 6.6 | | | |
| Salmon La Sac | 21B39 | | 4/20 | 20 | 8.6 | New Course | | |
| | | | 4/29 | 0 | 0.0 | | | |
| Snoqualmie Pass | 21B33 | | 4/20 | 80 | 38.1 | New Course | | |
| | | | 4/28 | 75 | 35.4 | | | |
| | | | 5/9 | 49 | 25.4 | | | |
| | | | 5/20 | 38 | 17.0 | | | |
| | | | 5/31 | 18 | 10.0 | | | |
| #Stampede Pass | 21B10 | 3000 | 4/19 | 82 | 39.3 | -- | -- | -- |
| | | | 5/9 | 42 | 26.8 | -- | -- | -- |
| | | | 5/19 | 36 | 19.0 | 38.2 | 63.1 | 35.1* |
| | | | 5/30 | 9 | 5.3 | 21.8 | 61.9 | 17.3* |
| Tunnel Avenue | 21B8 | 2450 | 4/9 | 48 | 19.7 | -- | -- | -- |
| | | | 5/9 | 8 | 3.8 | 4.5 | 24.5 | 9.2* |
| | | | 5/20 | 0 | 0.0 | 0.0 | 13.9 | -- |
| White Pass (E Side) | 21C28 | 4500 | 5/13 | 28 | 14.1 | 17.6 | 28.4 | 25.4* |
| | | | 5/31 | 0 | 0.0 | 12.1 | 23.8 | -- |
| #Olallie Meadows | 21B2 | 3625 | 4/19 | 96 | 43.8 | -- | -- | -- |
| | | | 5/9 | 67 | 34.7 | -- | -- | -- |
| | | | 5/20 | 60 | 32.3 | -- | -- | -- |
| | | | 5/31 | 37 | 20.6 | -- | -- | -- |

Not directly on this drainage

* Adjusted 1948-62 average

APPENDIX 4

| | | | SNOW COVER MEASUREMENT | | | | | |
|------------------------------------------------------|--------|-------|------------------------|-------------------------|---------|-----------------------|-------|-------|
| | | | 1966 | : P a s t R e c o r d | | | | |
| DRAINAGE BASIN | | | Date | Snow | Water | : Water Content (In.) | | |
| and | | | of | Depth | Content | : 1948-62 | | |
| SNOW COURSE | No. | Elev. | Survey | (In.) | (In.) | : 1965 | 1964 | Avg. |
| <u>L O W E R C O L U M B I A D R A I N A G E</u> | | | | | | | | |
| <u>COWLITZ RIVER</u> | | | | | | | | |
| White Pass (E Side) | 21C28 | 4500 | 5/13 | 28 | 14.1 | 17.6 | 28.4 | 25.4* |
| | | | 5/31 | 0 | 0.0 | 12.1 | 23.8 | -- |
| <u>P U G E T S O U N D D R A I N A G E</u> | | | | | | | | |
| <u>GREEN RIVER</u> | | | | | | | | |
| Stampede Pass | 21B10 | 3000 | 4/19 | 82 | 39.3 | -- | -- | -- |
| | | | 5/9 | 42 | 26.8 | -- | -- | -- |
| | | | 5/19 | 36 | 19.0 | 38.2 | 63.1 | 35.1* |
| | | | 5/30 | 9 | 5.3 | 21.8 | 61.9 | 17.3* |
| <u>SKYKOMISH RIVER</u> | | | | | | | | |
| #Stevens Pass | 21B1 | 4070 | 5/16 | 66 | 31.7 | 41.2 | 72.7 | 47.8* |
| | | | 6/2 | 32 | 15.7 | 31.9 | 60.3 | 29.5* |
| <u>BAKER RIVER</u> | | | | | | | | |
| Dock Butte | 21A11A | 3800 | 5/17 | 142 | 70.5 | 62.6 | 106.6 | -- |
| | | | 5/30 | 115 | 62.3 | -- | 95.3 | -- |
| Easy Pass | 21A7A | 5200 | 5/17 | 158 | 81.5 | 83.5 | 136.6 | -- |
| | | | 5/30 | 133 | 75.8 | -- | 118.7 | -- |
| Jasper Pass | 21A6A | 5400 | 5/17 | 176 | 93.1 | 84.3 | 118.2 | -- |
| | | | 5/30 | 152 | 86.7 | -- | 109.0 | -- |
| Marten Lake | 21A9A | 3600 | 5/17 | 154 | 79.0 | 71.7 | 115.7 | -- |
| | | | 5/30 | 130 | 72.2 | -- | 104.8 | -- |
| Rocky Creek | 21A12A | 2100 | 5/17 | 26 | 13.7 | 3.0 | 29.3 | -- |
| | | | 5/30 | 0 | 0.0 | -- | 5.4 | -- |
| Schreibers Meadow | 21A10A | 3400 | 5/17 | 125 | 63.0 | 54.8 | 90.5 | -- |
| | | | 5/30 | 98 | 51.8 | -- | 76.0 | -- |
| S.F. Thunder Creek | 21A14A | 2200 | 5/17 | 0 | 0.0 | 0.0 | 0.0 | -- |
| | | | 5/30 | 0 | 0.0 | 0.0 | 0.0 | -- |
| Sulphur Creek | 21A13 | 1600 | 5/17 | 0 | 0.0 | 0.0 | 8.9 | -- |
| | | | 5/30 | 0 | 0.0 | 0.0 | 0.0 | -- |
| Watson Lakes | 21A18A | 4500 | 5/17 | 142 | 70.6 | 65.1 | 94.4 | -- |
| | | | 5/30 | 121 | 65.8 | -- | 86.7 | -- |

Not directly on this drainage

* Adjusted 1948-62 average

APPENDIX 5

| | | | SNOW COVER MEASUREMENT | | | | |
|-------------------------|-------|-------|------------------------|-----------------------|---------------------|---------------------|-----------|
| | | | 1966 | : P a s t R e c o r d | | | |
| DRAINAGE BASIN and | | | Date of | Snow Depth | Water : Content: | Water Content (In.) | |
| SNOW COURSE | No. | Elev. | Survey | (In.) | (In.) | :1965 | 1964 Avg. |
| <u>SNOQUALMIE RIVER</u> | | | | | | | |
| Bandera Air Strip | 21B32 | | 4/20 | 0 | 0.0 | New Course | |
| Olallie Meadows | 21B2 | 3625 | 4/19 | 96 | 43.8 | -- | -- |
| | | | 5/9 | 67 | 34.7 | -- | -- |
| | | | 5/20 | 60 | 32.3 | -- | -- |
| | | | 5/31 | 37 | 20.6 | -- | -- |
| | | | | | | | -- |
| Snoqualmie Pass | 21B33 | | 4/20 | 80 | 38.1 | New Course | |
| | | | 4/28 | 75 | 35.4 | | |
| | | | 5/9 | 49 | 25.4 | | |
| | | | 5/20 | 38 | 17.0 | | |
| | | | 5/31 | 18 | 10.0 | | |

Agencies Assisting with Snow Surveys

GOVERNMENT AGENCIES

Canada:

Department of Lands, Forests and Water Resources,
Water Resources Service, British Columbia

States:

Washington State Department of Conservation
Washington State Department of Natural Resources

Federal:

Department of the Army
Corps of Engineers
U. S. Department of Agriculture
Forest Service
U. S. Department of Commerce
Weather Bureau
U. S. Department of the Interior
Bonneville Power Administration
Bureau of Reclamation
Geological Survey
National Park Service

PUBLIC AND PRIVATE UTILITIES

Chelan County P.U.D.
Pacific Power and Light Company
Puget Sound Power and Light Company
Washington Water Power Company

OTHER PUBLIC AGENCIES

Okanogan Irrigation District
Wenatchee Heights Irrigation District

MUNICIPALITIES

City of Walla Walla
City of Tacoma
City of Seattle

Other organizations and individuals furnish valuable information for snow survey reports. Their cooperation is gratefully acknowledged.

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